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EUCALYPTOGRAPHIA.

A DESCRIPTIVE ATLAS

OF THE

EUCALYPTS OF AUSTRALIA

AND THE

ADJOINING ISLANDS;

BY

BARON FERD. VON MUELLER, K.C.M.G., M. & PH.D., F.R.S.,

GOVERNMENT BOTANIST FOR THE COLONY OF VICTORIA.

"NON SUCCIDERE ARBORES, NEC SECURIBUS DEBES VASTARE EARUM REGIONEM."—*Liber Deuteronomii* xx. 19.

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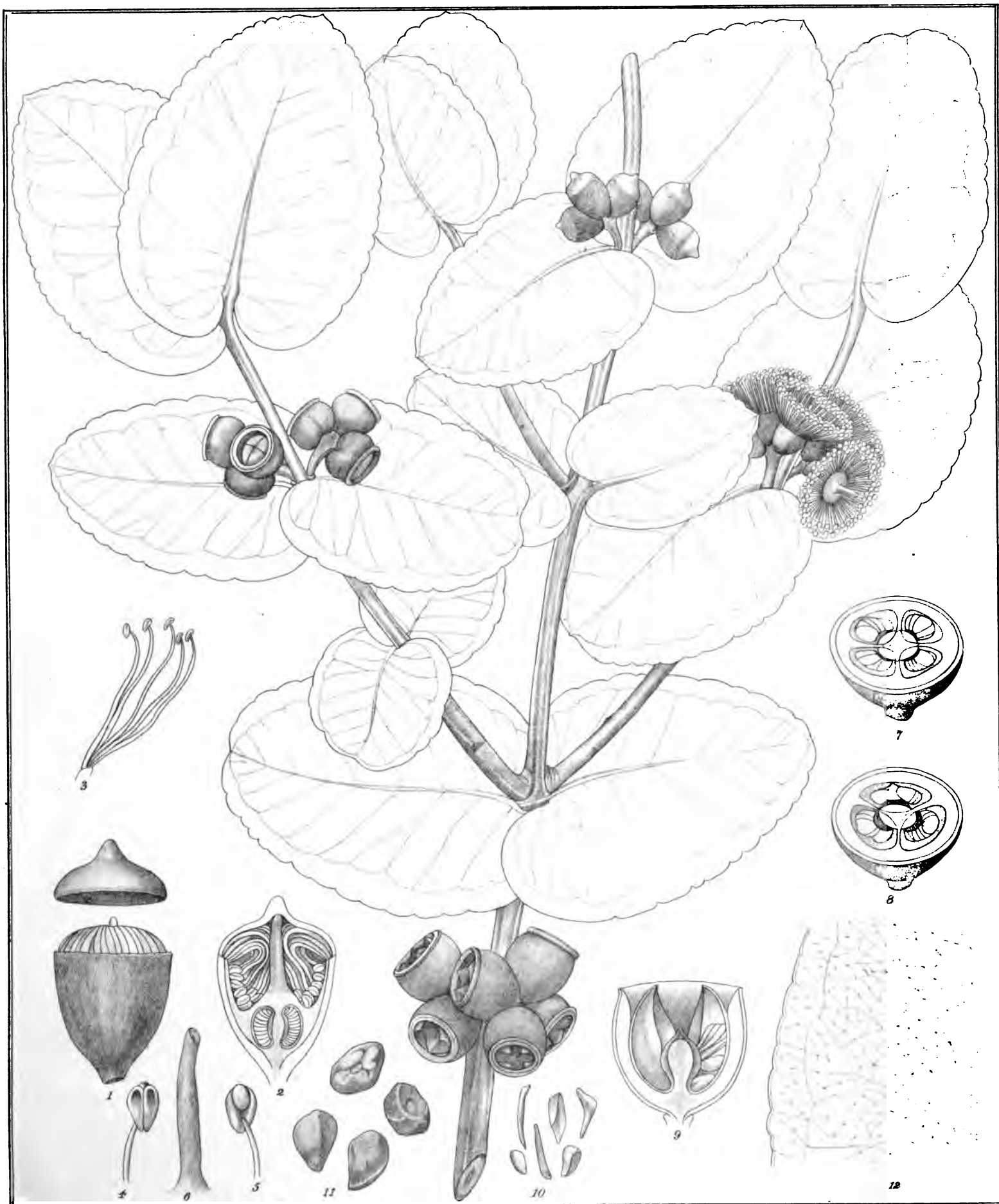
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Eucalyptus cordata. *Labillardiere*.

EUCALYPTUS CORDATA.

Labillardière, *Novæ Hollandiæ plantarum specimen* ii. 13, t. 152 (1806); Sprengel, *systema vegetabilium* ii. 501; De Candolle, *prodromus systematis naturalis regni vegetabilis* iii. 221; G. Don, *general system of dichlamydeous plants* ii. 821; D. Dietrich, *synopsis plantarum* iii. 123; J. Hooker, *flora Tasmanica* i. 132; Bentham, *flora Australiensis* iii. 224.

Arborescent; branchlets mostly sharp-quadrangular; *leaves all sessile and opposite, orbicular-cordate* or sometimes broad-ovate, always clasping at the base, slightly crenulated, dull-green on both sides; the lateral veins very spreading, rather distant, somewhat prominent, the circumferential vein irregularly remote from the edge of the leaf; oil-glands copious, unequal, transparent; *flowers axillary*, seldom also terminal, three or sometimes two rarely four together; calyces as well as flowerstalks and branchlets and sometimes also the leaves more or less tinged by a greyish- or bluish-white bloom; stalks not or somewhat angular, about as long as the flowers or shorter or wanting; *stalklets none*; tube of the calyx mostly semiovate, somewhat or doubly longer than the depressed-hemispherical short-pointed lid, not angular; stamens all fertile, inflexed before expansion; anthers nearly ovate, bursting by longitudinal slits; stigma not dilated; fruits semiovate or verging into a hemispheric form, 3- or 4- or rarely 5-celled, not angular; *rim narrow*, slightly annular; valves deltoid, affixed not far below the orifice, but quite enclosed or only their apex exserted; placental column about twice as long as broad; sterile seeds much narrower than the fertile seeds, partly elongated, all without any appendage.

In the south-eastern litoral region of Tasmania, thus on D'Entrecasteaux's Channel, on the lower Huon-River and towards the mouth of the Derwent, ascending to elevations of 1,600 feet above the sea level, occurring chiefly in poor shaley ground.

The original discoverer of this species found it near Recherche-Bay, and it was noticed subsequently in the same region by Dr. R. Brown, Sir Joseph Hooker, Mr. R. Gunn, Mr. T. Stephens and Mr. F. Abbott. To the two last-mentioned gentlemen I am indebted for material, enabling me to describe and illustrate this species. It may have been more frequent before Hobart was built, but it still occurs, though sparingly, within two miles of the city. Perhaps it extends to Port Davey, the interjacent coast-region being botanically almost unexplored.

It seems often to remain of shrubby growth; rooted specimens are before me barely 3 feet high, yet bearing flowers and fruits already. In that state it is the dwarfiest of all Eucalypts, except *E. verrucosa*, although the latter may constitute merely a glacial-grown pygmy-form of *E. Gunnii*. Nevertheless *E. cordata* rises often to 30 feet height, as noticed by Mr. Abbott;—and inasmuch as trees 50 feet high were seen by Mr. Coombs on the Sandfly-Rivulet, showing a stem-diameter of 18 inches, it seems quite likely, that Labillardière, while wandering through the grand and then undisturbed forests along d'Entrecasteaux-Channel, noticed still higher trees of *E. cordata*, justifying to some extent the designation "*arbor procera*," bestowed by him on this species.

Branches usually not numerous. Bark of stem comparatively thin, solid, outside but very slightly wrinkled, dark-colored and marked with whitish blotches. Sap sweet (Abbott). The pairs of leaves stand crosswise above each other as in all other Eucalypts with opposite leaves; they are seldom so pointed and perhaps never so strongly crenulated as from Redouté's delineation they would appear, an observation recorded already in 1819 by R. Brown in the *Botanical Magazine* 2087; and certainly the lateral veins of the leaves are too strongly marked in the plate of Labillardière's work. Greatest length of leaves 4 inches; the summit rounded-blunt or sometimes terminated by a short narrow point; crenulations sometimes obliterated; pellucid glandular dots in the leaves angular; reticular veinlets very subtle. Occasionally a

EUCALYPTUS CORDATA.

second stalk, bearing however but one flower, from the same axis. Lid nearly half as long as the tube of the calyx or variously shorter. Filaments pale; anthers dorsifixed, gradually attenuated at the lower end, the dorsal gland under the summit conspicuous. Style not equalling the length of the stamens. Fruit from $\frac{1}{3}$ to fully $\frac{1}{2}$ inch in diameter, sometimes slightly contracted at the summit, not rarely a little constricted beneath the ring-like margin; capsular vertex slightly convex. Sterile seeds partly very short, partly slender, and rather above a line long; fertile seeds obtusangular, measuring $\frac{1}{2}$ to nearly one line.

The shrub or tree flowers during July and August. It seems not to descend to the coast.

As remarked by Bentham, *E. cordata* stands in relation near to *E. cosmophylla* and particularly to *E. pulverulenta*, indeed the latter being illustrated as *E. cordata* by Loddiges. *E. cosmophylla* however has elongated stalked and scattered leaves, the rim of the fruit broad and the seeds more angular. *E. pulverulenta* has the branchlets generally more slender and not acute-angular, the leaves not crenulated, but dotted with roundish almost uniform oil-pores, the flowers generally smaller, the tube of the flowering calyx downward obconically attenuated, while the lid is less depressed; the fruit is smaller, more topshaped and has a comparatively broader rim, the convergent free part of the valves emanates almost at a level with the calyx-edge and arises not distinctly beneath the rim; the furrow between the discal lining and the calyx-tube is running just beneath the edge of the fruit, not forming a faint vertical channel around the rim. Crenulated leaves occur also in *E. urnigera*, and, strange as it may appear, it is to this species, that *E. cordata* bears the closest alliance; for although the aged state of *E. urnigera* has scattered long-stalked dark-green and lanceolar-sickle-shaped leaves, more slender elongated and downward more attenuated calyces on conspicuous stalklets with ampler lid and urnshaped fruits with deeply enclosed valves, yet trees are now known (through Mr. Stephens from "Old Man's Head," a subalpine mountain near Lake Crescent), which to all appearance form a complete transit from *E. urnigera* to *E. cordata*. Moreover Mr. Aug. Oldfield sent many years ago from the middle-regions of Mount Wellington sterile saplings as the young state of *E. urnigera*, the adventitious lower shoots of which can in no way be distinguished in foliage from *E. cordata*, and which are also partly pruinous. On the summit of Mount Wellington I collected a state of *E. urnigera* with all leaves nearly oval and with simply truncate-ovate fruits. Hybridism does not seem to explain the origin of these aberrant forms in a genus, where against cross-fertilisation is guarded by a calycine lid; though—as pointed out by Mr. W. Sh. McLeay—the possibility of such a process is thereby not absolutely excluded, as Parrots, Kakatoos and some other birds, while feeding on young Eucalyptus flowers, may carry the pollen of one species to the stigma of another.

EXPLANATION OF ANALYTIC DETAILS.—1, an unexpanded flower, the lid lifted; 2, longitudinal section of an unexpanded flower; 3, some stamens in situ; 4 and 5, front- and back-view of an anther, with part of its filament; 6, style and stigma; 7 and 8, transverse sections of fruit; 9, longitudinal section of a fruit; 10 and 11, sterile and fertile seeds; 12, portion of a leaf; all more or less magnified.



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Eucalyptus erythronema. *Jurczaninow.*

EUCALYPTUS ERYTHRONEMA.

Turczaninow, in Bulletin de l'Académie des sciences de St. Petersburg 1852, p. 415 ; *E. conoidea*, Bentham, flora Australiensis iii. 227.

Branchlets almost cylindrical ; leaves comparatively small, scattered, short-stalked, generally narrow-lanceolar, nearly straight or somewhat curved, of equal color and rather shining on both sides ; lateral veins subtle, some not much spreading, none crowded, the circumferential vein distinctly removed from the edge of the leaf ; *oil-dots very copious, transparent ; umbels recurved*, axillary and lateral, solitary, 3-6-flowered ; stalks cylindrical, shorter than the stalklets or hardly as long ; tube of the calyx almost topshaped, very gradually attenuated at the base, somewhat streaked, usually about half as long as the conical lid ; stamens all fertile, sharply inflexed before expansion ; *filaments red*, rather thick and angular ; anthers pale, oblong, nearly basifixed, opening in their whole length by almost marginal slits ; their gland not tumid ; style longer than the stamens, thickened at the summit ; *fruit broadly topshaped, surrounded beneath the broad and flat rim by an annular impression*, the tube not angular ; valves 4-5, short, deltoid, affixed to the summit of the orifice ; fertile seeds considerably larger than the sterile seeds, all without any appendage.

Towards the remotest eastern sources of Swan-River and also near Mount Lindsay ; Th. Muir.

Height of this Eucalypt unrecorded, not likely considerable. Most leaves between $1\frac{1}{2}$ and $2\frac{1}{2}$ inches long, and between $\frac{1}{2}$ and $\frac{3}{4}$ inch broad, some occasionally oblong. Umbels sometimes crowded on the branchlets. Umbel-stalks usually from $\frac{1}{2}$ to $\frac{3}{4}$ inch long, downward or spreadingly bent, a characteristic not expressed in Mr. Todt's drawing, in which also the flowerstalklets of two of the umbels became too much abbreviated. Stalklets not angular. Tube of the flowering calyx hardly $\frac{1}{2}$ inch long, but soon enlarging, and then not rarely the edge turning outward ; lid when well developed about $\frac{1}{2}$ an inch long, and its summit conspicuously attenuated, but exceptionally much shortened and assuming a hemiellipsoid form. Stigma depressed-hemispheroid, not dilated beyond the style-summit. Ripe fruit attaining a length of $\frac{1}{2}$ an inch, shining, not angular, the annular furrow at first vertical and then the disk convex, the latter occupying rather an ample space between the valves and the edge of the fruit ; valves convergent and thus scarcely emersed, though terminal.

This species of Eucalyptus was first described from the collections of Mr. James Drummond, who however attached to none of the very numerous specimens of West-Australian plants, gathered by him through 40 years, any notes on localities and habit. The leaves remind of those of *E. amygdalina*, though they are smaller ; the lid is much like that of *E. tereticornis* ; the fruit is not very similar to that of any other congener.

As regards utility *E. erythronema* has evidently value for oil-distillation, while the rich color of its filaments, from which the specific name was derived, give it some claim for a place in ornamental shrubberies.

This is one of the enormous numbers of endemic plants, for which the vegetation of extra-tropical Western Australia is so remarkable, the genus Eucalyptus forming there no exception to that rule, inasmuch as out of 36 well-marked extratropical species, known from there, 29 are not occurring in any other portion of Australia ! The list of these peculiar western Eucalypts is here adduced :—

E. marginata, *E. buprestium*, *E. sepulcralis*, *E. decipiens*, *E. macrocarpa*, *E. Preissiana*, *E. megacarpa*, *E. erythronema*, *E. cæsia*, *E. tetraptera*, *E. salmonophloia*, *E. leptopoda*, *E. salu-*

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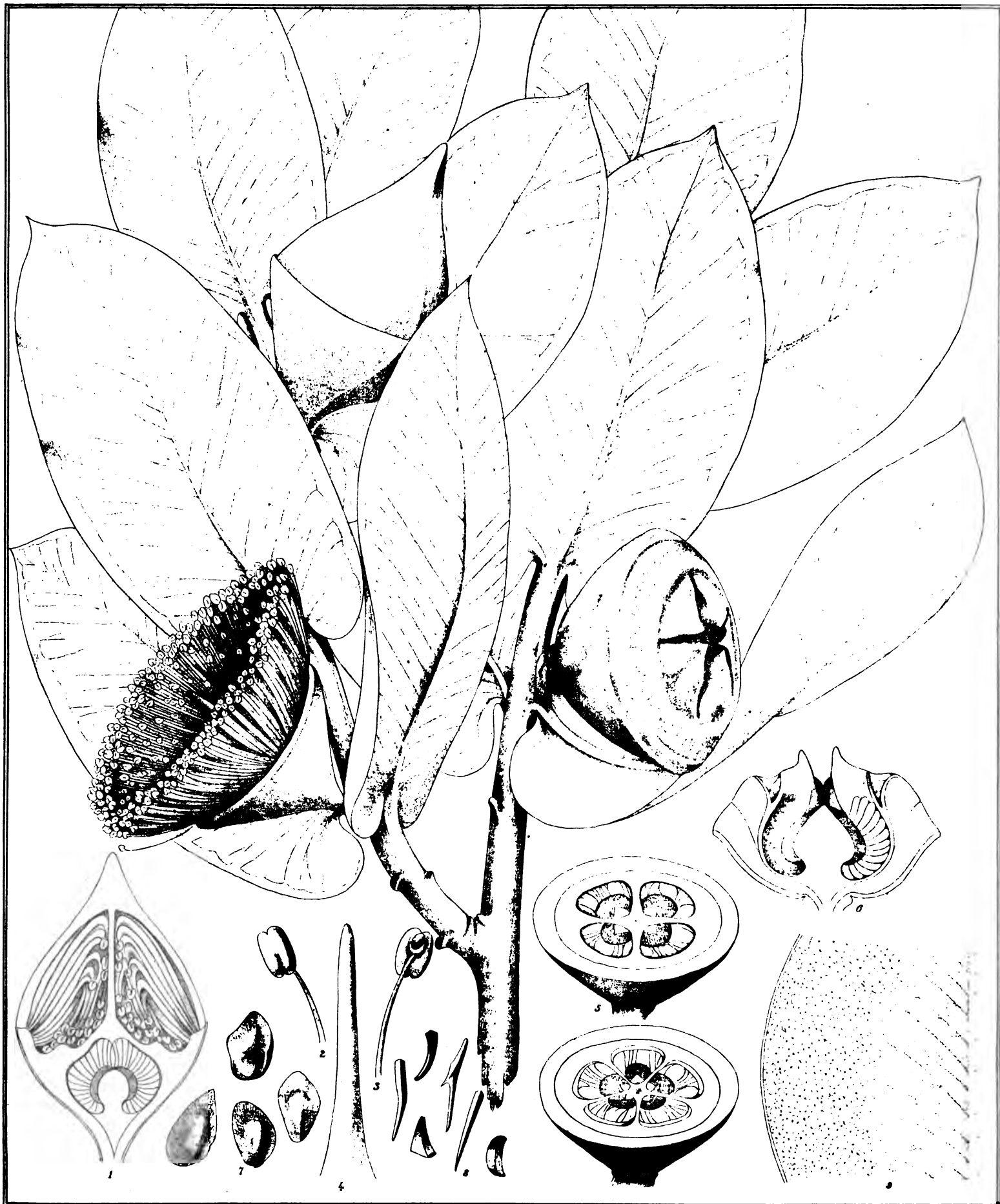
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Eucalyptus macrocarpa. *J. Hooker.*

EUCALYPTUS MACROCARPA.

Hooker, icones plantarum 405-407 (1842); Botanical Magazine t. 4333; Schauer, in Lehmann plantæ Preissianæ i. 132; Walpers, repertorium botanices systematicæ ii. 164; Paxton, Magazine of Botany xv. 29, with illustrative figure; F. v. M., fragmenta phytographiæ Australiæ ii. 41; Bentham, flora Australiensis iii. 224; A. Smith, in Lindley's and Th. Moore's Treasury of Botany, with woodcut, 1866, 1873 and 1876.

Shrubby, *all over mealy with a whitish bloom; leaves all opposite, sessile, ovate- or roundish-heartshaped*, short-pointed, clasping with bilobed base; veins rather close, much spreading, the circumferential vein at some distance from the edge of the leaf; oil-dots numerous, mostly concealed; *flowers very large, nearly sessile, solitary, axillary*; tube of the calyx depressed-turbinate, not quite so long as the hard pyramidal-semiglobular short-pointed lid, not conspicuously angular; stamens all fertile, the inner much inflexed before expansion, the outer only incurved at the apex; *filaments orange-colored or crimson*, seldom pale; anthers almost oval, opening with marginal slits; stigma not broader than the summit of the style; *fruit very large, its calycine portion depressed turbinate, not angular, the discal portion very broad, ascending*; valves exserted, 4-5 or rarely 6, large, nearly deltoid; fertile seeds much larger than the partly very narrow sterile seeds and edged by a broadish marginal membrane.

From Dungen-Peak eastward through the Guangan-Desert (J. Drummond); in the scrub-country near the south-eastern sources of Swan-River (Oliver Jones); in the arid somewhat elevated and undulated tracts between the Irwin- and Greenough-River as well in sandy as in gravelly soil (F. v. M.); near the north-eastern sources of the Blackwood-River (Th. Muir).

Tall and ample as a shrub, but never, so far as known, of truly arborescent growth. Branchlets stout, at first angular, but generally soon cylindrical. Leaves rather crowded on the branchlets, of stiff consistence, occasionally as much as 5 inches long and $3\frac{1}{2}$ inches broad, the greyish or bluish-white bloom finally much evanescent; oil-dots transparent only in young leaves. Lid almost woody, attaining a height of nearly $1\frac{1}{2}$ inches, slightly streaked, sharp at the edge. Filaments angular, those of the outer stamens reaching a length of fully an inch. Anthers yellow, fixed near or above the base, sometimes verging almost into a cordate form, those of the outer stamens not concealed by the slight infraction of their filaments. Style rather long. Fruit $1\frac{1}{2}$ - $2\frac{1}{2}$ inches broad, surrounded by an annular somewhat sharp margin, from which the broad discal portion of the vertex concavely ascends, which latter however may at advanced age become somewhat convex. Valves finally erect. Placental column at last semiovate-pyramidal, the cavity of the cells penetrating beneath the placentas. Fruitstalk sometimes $\frac{1}{4}$ inch long. Fertile seeds radiating-angular from the hilum to the membranous margin, the whole measuring 2-3 lines; some of the sterile seeds quite as long or even longer, but remarkably slender.

There is only one other species of Eucalyptus, to which E. macrocarpa stands really in near affinity, namely, E. pyriformis; for notwithstanding the great disresemblance arising from the not general glaucous hue, from the stalked as well as scattered and narrower leaves, and from the generally three-flowered umbels of the latter, it must be conceded that flowers and fruits are constructed upon the same type; indeed in Drummond's collection occur specimens of E. pyriformis with opposite and already broader leaves though stalked and green; the mealy whiteness however of E. pyriformis is confined to the young calyces chiefly or solely, the flower-stalks are never wanting, the tube of the calyx is often contracted into a distinct stalklet, the disk of the fruit-summit is more elevated, ascends above the base of the valves and may even overreach them, while the calycine portion of the fruit is usually distinctly marked with radiating narrow ridges, a characteristic in which the lid also mostly participates. But in the variety

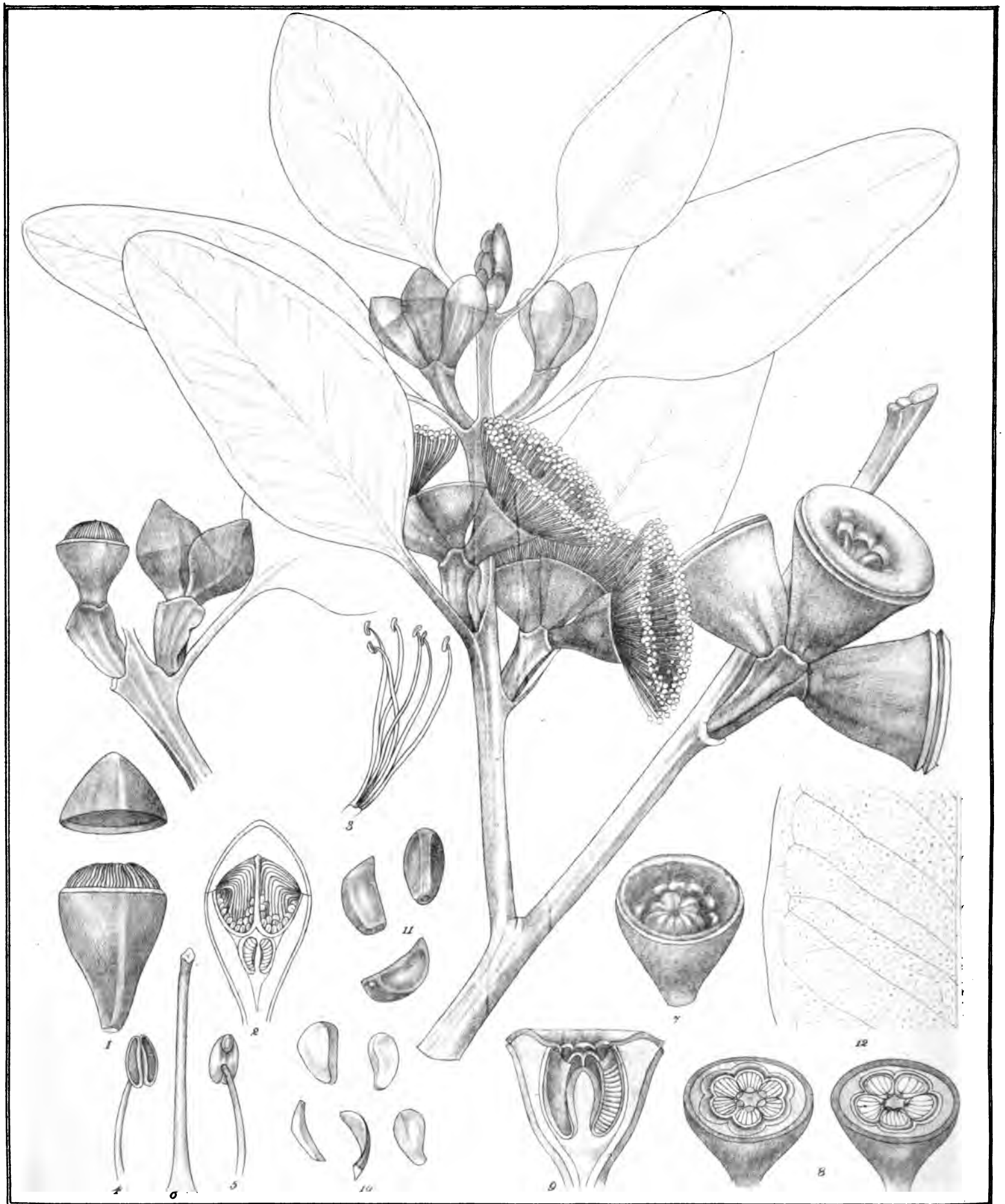
EUCALYPTUS MACROCARPA.

Youngiana of *E. pyriformis* the stalklets are almost wanting, though fruitstalks are always developed. This is one of the largest-fruited of all Eucalypts, thus the specific name is well chosen.

The first notice of this remarkable species occurs in Sir William Hooker's Journal of Botany, 1840, p. 360, from a letter of Mr. James Drummond, who discovered the plant in the previous year. It has claims for ornamental culture, especially when scenic effect is desired, as the flowers are so large and handsome, while the ashy grey of the foliage contrasts remarkably with the ordinary green of shrubberies. As this bush is only sparsely distributed in its own region, it is to be feared, that in course of time, by the methodic "burning off," to which the "scrub-lands" are subjected by the settlers, it will pass altogether out of natural existence like so many other local plants of Australia, to make space for the upgrowth of pastoral vegetation. Hence the desirability of giving this Eucalypt a permanent footing in horticulture abroad. While travelling through regions of its growth, I found that this species most readily ignites. The accomplished Miss North prepared, during her recent stay in West-Australia, among the oil-paintings illustrative of indigenous vegetation, also a picture of this Eucalypt for the art-gallery, which she generously provides for the large museum of the Royal Botanic Garden of Kew, under Sir Joseph Hooker.

Already in 1849, while illustrating this species, Sir Joseph Paxton observed, that this and other Eucalypts "may be easily propagated by cuttings of the half-ripened wood, planted in sand under a hand-glass." This process may readily be resorted to, when especially in conservatory-culture any Eucalyptus should fail to mature seeds.

EXPLANATION OF ANALYTIC DETAILS.—1, longitudinal section of an unexpanded flower; 2 and 3, front- and back-view of an anther, with portion of its filament; 4, style and stigma; 5, transverse section of two fruits; 6, longitudinal section of a fruit; 7 and 8, fertile and sterile seeds; 9, portion of a leaf; 1, 5 and 6 of natural size; 2, 3, 4, 7, 8 and 9, magnified.

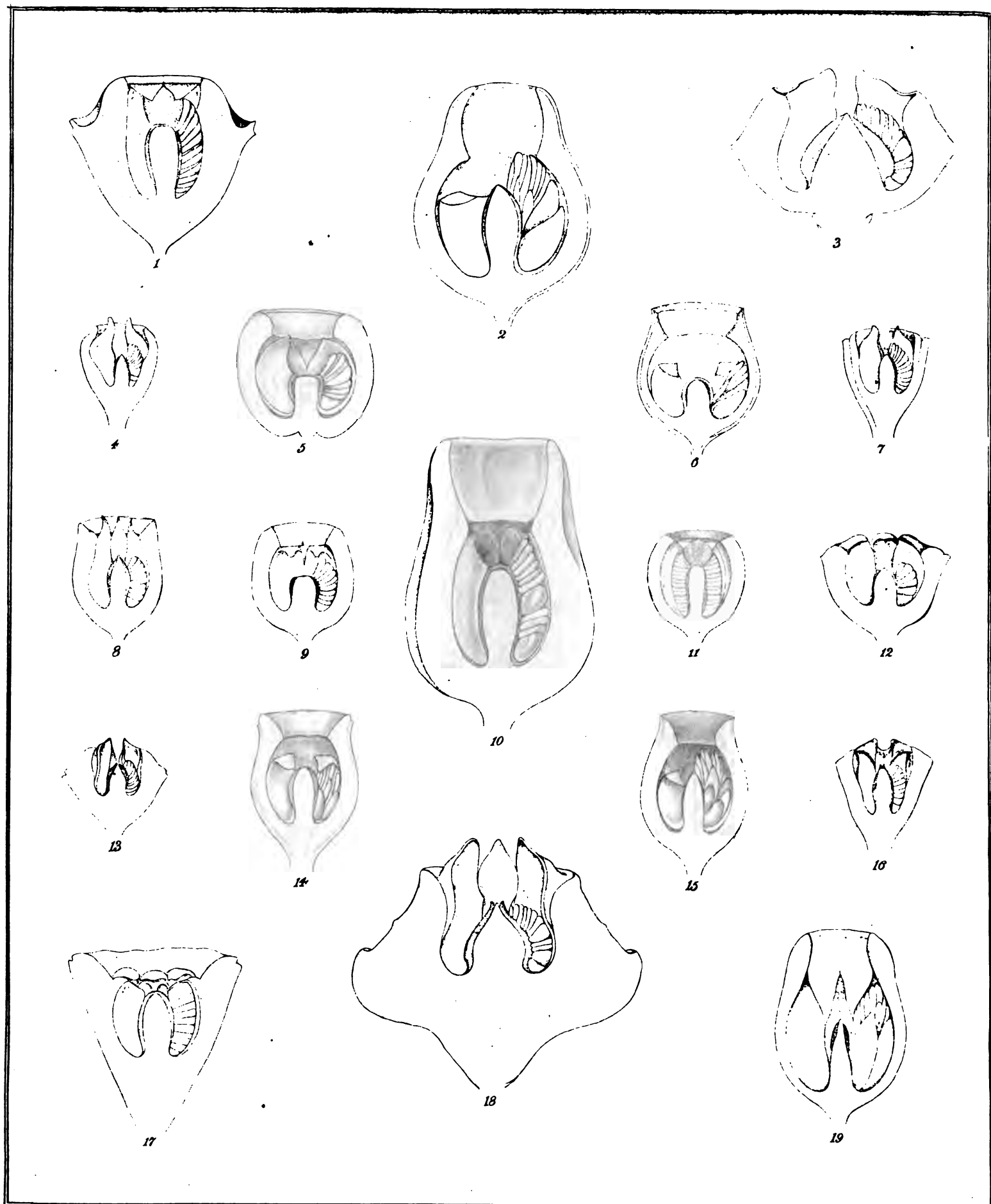


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Eucalyptus *Preissiana*. *Schauer*.



W. & A. G. F. & C. L. L.

F. & M. Dixson

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Eucalyptus - fruits, *longitudinal sections.*

EUCALYPTUS PREISSIANA.

Schauer, in *Lehmann plantæ Preissianæ* i. 131 (1844); Hooker, *Botanical Magazine*, t. 4266; F. v. M., *fragmenta phytographiæ Australiæ* ii. 38; iv. 52; Bentham, *flora Australiensis* iii. 232; *E. plurilocularis*, F. v. M., *fragmenta phytographiæ Australiæ* ii. 70.

Shrubby; branchlets stout, compressed-quadrangular; *leaves lanceolar- or oblong- or broad-ovate, opposite* or some alternate and then generally approximated in pairs, always conspicuously stalked, of very thick consistence, of equal coloration on both sides; their lateral veins much spreading and rather remote, the circumferential one distant from the edge of the leaf; oil-dots copious, much concealed; *flowers large, axillary, two or oftener three together* on broad compressed stalks, but hardly provided with any or but short and thick stalklets; tube of the calyx semi-ovate, gradually contracted at the base, not angular; lid semi-ovate- or depressed-hemispherical, slightly shorter than the tube of the calyx or sometimes only half as long; stamens all fertile, inflexed before expansion; *filaments pure-yellow*; anthers from cordate- to nearly oblong-ovate, short-lobed at the base, opening by longitudinal slits; style rather long; stigma not dilated; fruits large, turbinate-semi-ovate, smooth; space of the discal vertex from the edge to the valves nearly or fully as broad as the orifice, slightly convex or oftener descending, severed from the calyx-tube by a narrow furrow; valves 5-6, rarely 4, short, deltoid, permanently connivent, not protruding, surrounded by as many or twice as many depressed protuberances; *most sterile seeds attaining nearly the size of the fertile seeds*, all without any appendage.

Restricted to South-Western Australia, occurring in the vicinity of King George's Sound and at Cape Riche, thence extending at least as far as Stokes's Inlet (Maxwell) and Stirling's Range (F. v. M.), occupying generally stony localities, showing a predilection for the limestone-formation.

A shrub, rising to a tallness of 15 feet, but flowering already when only a few feet high. Branches of aged plants drooping. Leafstalks compressed, more or less twisted. Leaves exceptionally narrow oblong-lanceolar or even somewhat sickles shaped, oftener of a shining green than greyish-green; the oil-dots of aged leaves usually quite obliterated. Flowerstalks sometimes very much shortened, some finally by the lapse of leaves lateral. Calyx-tube when young mostly obconical; lid roundish-blunt or slightly and very seldom also sharply pointed. Subterminal gland of the anthers conspicuous; slits almost joining at the summit, or—when the gland is less developed—quite confluent. Fruit assuming sometimes almost the shape of that of *E. cosmophylla*, being less turbinate and more turgid at the base than usual, exhibiting a semi-ellipsoid form, being also of smaller size, more generally 4-celled, and having the verrucular prominences almost undeveloped; in rare instances the fruit becomes quite bellshaped. Fruit-vertex more or less descending. Wart-like elevations opposite to the dissepiments larger than those opposite to the seed-bearing cells. Placental column conical- or oval-cylindrical, almost twice as long as broad. Majority of seeds from nearly 1 to $1\frac{1}{2}$ lines long, none very narrow. The mutual similarity or even conformity of the fertile and sterile seeds place *E. Preissiana* so far near the *Renantheræ*, the broad sterile seeds occurring in but very few species outside of that group.

This species remains always of bushy habit, and thus keeps manageable for glasshouse-culture in colder countries, the foliage and particularly the bright-yellow filaments rendering it well worthy of a place in ornamental collections.

E. Preissiana is easily enough recognized among its congeners. In 1860 I alluded already to its position near *E. megacarpa*; and in the present work I have fully pointed out the marks of

EUCALYPTUS PREISSIANA.

distinction in the text of that species. The next, to which *E. Preissiana* bears alliance, is *E. cosmophylla*, but the leaves of the latter are more scattered (though not figured so), generally narrower and more acute, the flowerstalks are shorter and not much dilated, the flowers not so large, the filaments of paler color, the fruits smaller with less descending rim and never top-shaped, but always devoid of any prominences encircling the valves, while the sterile seeds are much more slender. *E. Oldfieldi* and *E. alpina* are still further removed. The frequent confluence of the longitudinal slits of the anthers in an arched terminal curvature reminds of the dehiscence of the *Renantheræ*.

Among other *Eucalypts* with opposite leaves none have leafstalks except the very dissimilar *E. tetradonta*, *E. erythrocorys*, *E. tetragona*, *E. grandifolia* and *E. doratoxylon* (the outer stamens of the latter having been illustrated as anantherous erroneously).

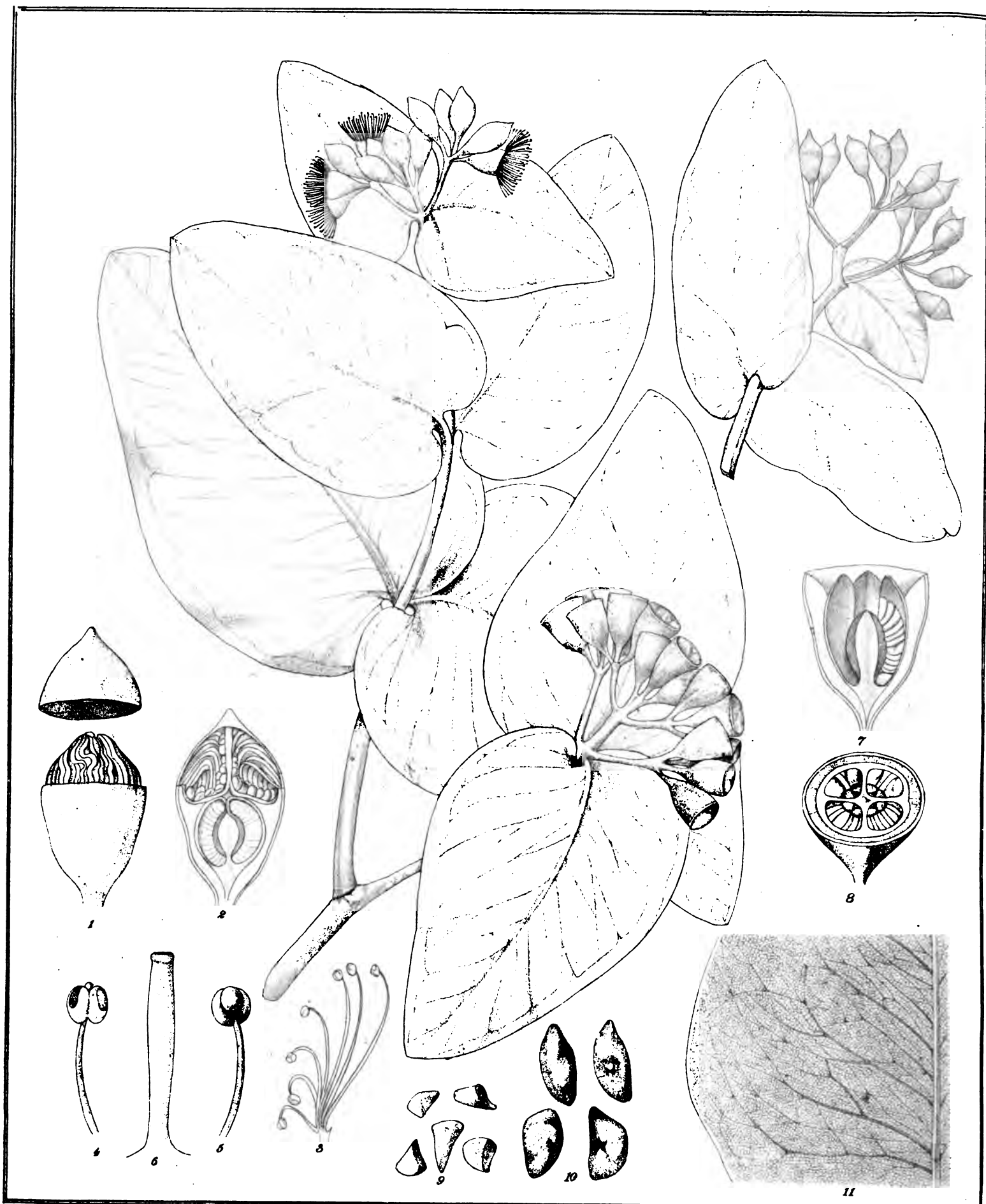
Bentham united with *E. Preissiana* also *E. pachypoda*, which is however identical with the almost simultaneously described *E. grossa*.

I have in the description laid some stress on the shape of the placental column in describing this and several other species of *Eucalyptus*. An apt opportunity is afforded now, to contrast the main-differences, shown by that organ in a number of *Eucalypts* through a special illustrated plate, hereto appended.

The specimens, from which this *Eucalypt* was first described, were got by Dr. Ludwig Preiss, who from 1839 to 1841 instituted extensive searches after objects of natural history in South-Western Australia, and then brought together also large collections of Museum-plants from regions then teeming with novelties; among several new species of *Eucalyptus*, contained in his collections, the present one was chosen by Dr. J. C. Schauer to commemorate this meritorious collector's name.

EXPLANATION OF ANALYTIC DETAILS.—1, an unexpanded flower, the lid lifted; 2, longitudinal section of an unexpanded flower; 3, some stamens in situ; 4 and 5, front- and back-view of an anther with portion of filament; 6, style and stigma; 7, a separate fruit; 8, transverse section of two fruits; 9, longitudinal section of a fruit; 10 and 11, sterile and fertile seeds; 12, portion of leaf; fig. 1-6 and 10-12 variously magnified, 7-9 of natural size.

EXPLANATION OF ANATOMIC PLATE.—Longitudinal sections of various *Eucalyptus*-fruits, natural size: 1, *E. erythrocorys*; 2, *E. calophylla*, the horizontal valve, adnate to the broad dissepiment, at the back of the cavity removed; 3, *E. megacarpa*, in some fruits the longitudinal section shows the channel more distinctly between the valves and the ring of the disk, the prominence of the annular protrusion being then also more conspicuous; 4, *E. obcordata*; 5, *E. buprestium*; the sterile seeds are sometimes broader; 6, *E. setosa*; 7, *E. longifolia*, the placentas are occasionally broader; 8, *E. cassia*; 9, *E. Planchoniana*, the sterile seeds occur sometimes broader; 10, *E. miniata*; 11, *E. tetragona*; 12, *E. megacarpa*, the placentas are sometimes slightly larger; 13, *E. Oldfieldi*; 14, *E. Watsoniana*; 15, *E. Abergiana*; 16, *E. gomphocephala*; 17, *E. Preissiana*; 18, *E. pyriformis*; 19, *E. sicifolia*.



Todd del. C. Troedel & Co. Lith.

F. v. M. direct.

Steam Litho Gov. Printing Office Melb.

Eucalyptus pruinosa. Schauer

EUCALYPTUS PRUINOSA.

Schauer, in Walpers repertorium botanices systematicæ ii. 926 (1843); F. v. M., fragmenta phytographiæ Australiæ iii. 132; Bentham, flora Australiensis iii. 213 (not of Turczaninow); E. spodophylla, F. v. M., fragmenta phytographiæ Australiæ ii. 71.

Glabrous; *leaves all opposite, sessile*, roundish- or oftener oval-cordate, as well as the branchlets and inflorescence generally tinged with a whitish-grey somewhat evanescent bloom; primary veins of the leaves mostly subtle, rather distant, very spreading, the circumferential vein irregularly remote from the margin; oil-dots obliterated; *umbels in short terminal panicles*; flowers in each umbel 7 or fewer; stalklets thin, about as long as the tube of the calyx or variously shorter; lid conic-hemispherical, slightly acute or short-pointed, from about half as long to fully as long as the obconic-semiovate tube of the calyx; stamens short, all fertile, inflexed before expansion; *anthers minute, almost globular*, opening by lateral pore-like slits; style short; stigma not dilated; fruit semiovate, somewhat attenuated at the base; valves 4 rarely 3 or 5, short, reaching to the narrow rim or slightly protruding beyond it; fertile seeds without any appendage, their testa net-veined; sterile seed smaller, the majority broad and short, some narrow and more elongated.

Rather frequent in arid country around the Gulf of Carpentaria and in Arnhem's Land, especially on the sandstone-tablelands, extending southward at least to the sources of the Victoria-River, the commencement of Sturt's Creek (F. v. M.) and of Ord-River (Al. Forrest), occurring also on the islands of Carpentaria (R. Brown, Bauer, Henne).

A small or middle-sized tree; bark persistent, rough, wrinkled, greyish outside. Branchlets sometimes sharply sometimes hardly angular. Leaves equilateral, horizontally spreading, quite or nearly sessile. One or few of the umbels occasionally axillary, their stalks never much elongated. Neither lid nor tube of the calyx angular. Anthers of some of the outer stamens broader than long and verging even into a renate form. Style rather thick, only about $\frac{1}{4}$ th inch long. Ovules extending quite around the summit of the placental column. Fruits sometimes barely half the length and width of those illustrated in the lithographic plate, and the valves occasionally more terminal.

It is only *E. melanophloia*, with which our present species could be confounded; indeed the general resemblance of the two is so great, that Dr. Leichhardt mentions them in the journal of his famous "Overland Expedition from Moreton Bay to Port Essington" indiscriminately as the "Silver-leaved Ironbark-tree." In traversing North-Australia about a quarter of a century ago I noticed however, that *E. pruinosa* has the bark outside greyish and not so deeply fissured as that of *E. melanophloia*, which—as the name implies—has the bark blackish outside; moreover the last-mentioned species seems restricted to extra- and sub-tropical Australia, advancing south as far as the Namoi and often indicating an auriferous country. This different regional range, in which numerous other plants participate, was mentioned already in the Journal of the Proceedings of the Linnean Society 1859, p. 94. Furthermore the deeply furrowed bark brings *E. melanophloia* into the series of Schizophloïæ, while *E. pruinosa* would by Southern Colonists be classed with the so-called "Box-trees" (Rhytiphloïæ). Irrespective of these differences the anthers of *E. melanophloia* have generally longer openings than those of *E. pruinosa*; and although this characteristic is a trifling one, yet so much value was attached to it by Bentham, that he actually placed the two species into two different sections of his system of Eucalypts, notwithstanding their close affinity to each other in every respect. Besides the stigma of *E.*

EUCALYPTUS PRUINOSA.

melanophloia dilates slightly over the width of the style, and the fruit (so far as I have become aware) gets never so large as that of *E. pruinosa*, it being especially shorter and also distinctly contracted at the edge.

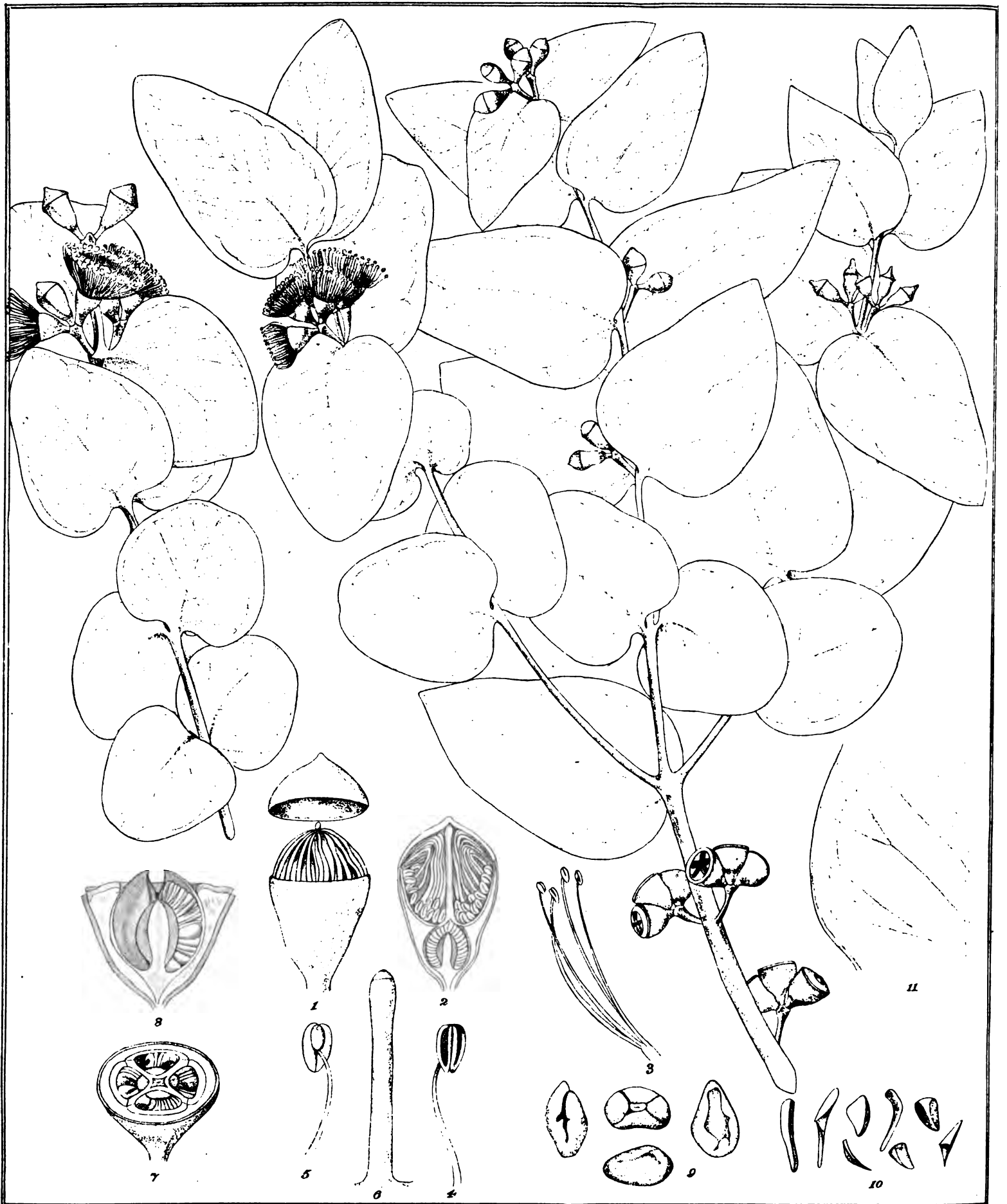
Among trees with roundish sessile greyish opposite leaves only to *E. pulverulenta* need be alluded here in reference to their distinguishing marks; but it has its umbels solitary and axillary, its anthers elongated and opening with longer slits and its fruits flat- or convex-rimmed.

The connate leaves, smaller flowers, shorter lid, longer anther-slits and most particularly the sharply triangular seeds, surrounded by a diaphanous membrane, distinguish *E. gamophylla* readily from *E. pruinosa*.

The very pale bloom of the foliage, which suggested the specific name, is chemically of waxy nature.

E. pruinosa might prove a good tree for fuel and perhaps also for technical purposes in any tropical country: it would at all events be as adapted to an equinoctial clime as *E. tereticornis*, *E. resinifera*, *E. acmenoides* and *E. Baileyana* have shown themselves suited to as well sandy as swampy grounds in Guinea, as observed by Dr. J. W. Rowland. The frequency of this tree in its wide natural region indicates the facility of its dissemination also.

EXPLANATION OF ANALYTIC DETAILS.—1, an unexpanded flower, the lid lifted; 2, longitudinal section of an unexpanded flower; 3, some stamens in situ; 4 and 5, front- and back-view of an anther, with portion of its filament; 6, style and stigma; 7 and 8, longitudinal and transverse section of fruit; 9 and 10, sterile and fertile seeds; 11, portion of a leaf; all figures more or less magnified.



Todt del. C. Troedel & Co lith.

F. & M. direxit.

Steam Litho Gov. Printing Office Melb.

Eucalyptus pulverulenta. Sims.

EUCALYPTUS PULVERULENTA.

Sims's Botanical Magazine, 2087 (1819); Colla, illustrationes et icones rariorum stirpium t. 1; Sprengel, systema vegetabilium ii. 501; De Candolle, prodromus systematis naturalis regni vegetabilis iii. 221; G. Don, general system of dichlamydeous plants ii. 821; D. Dietrich, synopsis plantarum iii. 123; F. v. M., fragmenta phytographiæ Australiæ ii. 70; Bentham, flora Australiensis iii. 224; E. cordata, Loddiges, Botanical Cabinet t. 328; Payer Organogénie t. 98; E. pulverigera, Cunningham, in Field's geographic memoirs on New South Wales 350; E. cinerea, F. v. M., in Bentham's flora Australiensis iii. 239.

Branchlets thin, nearly cylindrical; *leaves all sessile and opposite, from cordate-orbicular to ovate*, occasionally some rhomboid or lanceolar, clasping at the base, as well as the branchlets, flowerstalks and calyces *tinged by a whitish bloom*; lateral veins of the leaves very spreading, not or slightly prominent, the circumferential vein irregularly remote from the edge; oil-dots copious, mostly transparent; flowers axillary, only exceptionally also terminal, almost always three together; stalks generally shorter than the calyces or sometimes of fully their length, rarely longer, occasionally very much abbreviated, usually thin, not angular; stalklets none or extremely short; tube of the calyx semiovate-obconical; lid hemispherical and short-pointed or sometimes broad-conical, half or nearly as long as the tube; stamens all fertile, inflexed before expansion; *anthers nearly ovate, bursting by longitudinal slits*; style short; stigma not dilated; *fruits small, semiovate-topshaped*, 3-4 or rarely 5-celled; rim rather broad, somewhat convex; valves affixed almost at the orifice, very small, deltoid, convergent; sterile seeds numerous, much narrower and mostly shorter than the fertile seeds, the latter not sharply angular, all without any appendage.

In the vicinity of the Upper Lachlan- and of Cox's River (Cunningham); from Marulan to Yass (Moore, Wilkinson); near Berrima, Lake George and the Castlereagh-River (Woolfs); near Lake Omeo (F. v. M.); near the Buchan-River, between the Avon- and Mitchell-River, as also towards Walhalla (Howitt), preferential in the sandstone- and granite-formation.

A "scraggy" tree, attaining a height of 50 feet, exceptionally with a stem-diameter of 3 feet, but flowering already in a shrubby state. Stem comparatively short, branches arising already at a height of 10-15 feet from the ground, even in aged trees; wood brittle and twisted; bark fibrous, light-brown inside with a reddish tinge, shedding from the upper branches only or chiefly, outside wrinkled and becoming grey, thinner and of closer texture than that of *E. obliqua*. Foliage generally scanty, its whitish or ashy bloom variable as regards extent and intensiveness. Leaves sometimes very slightly crenulated, as noted already by Loddiges, but never so conspicuously as those of *E. cordata*. Umbels through the lapse of leaves finally often lateral; number of flowers sometimes increased to 4-5, rarely to 6-7, or very seldom reduced to two or only one; flowers of spontaneously grown trees never as large as those delineated by Curtis from a luxuriant conservatory plant; but the differences thus far are even greater in native trees of *E. globulus*, *E. Leucoxydon* and several other species. The tree passes under several vernacular names, that of the "Silver-leaved Stringybark-tree" being the most appropriate. *E. rigida* of Count Hoffmannsegg's Verzeichniss der Pflanzen-Kulturen 114 (1826) is probably referable to *E. pulverulenta*.

In the systematic definition and in the illustration I have not included an Eucalypt, the leaves of which in aged trees become elongated-lanceolar, much narrowed upwards and even somewhat sickles-shaped, though their base remains rounded and their stalk very short; moreover in the above-mentioned state some of the upper leaves become alternate or scattered. This particular Eucalypt was noticed in Upper Gippsland by Mr. A. W. Howitt, and near the Ovens-River by Mr. C. Falck. There is every reason to assume, that it is merely a state of *E. pulveru-*

EUCALYPTUS PULVERULENTA.

lenta, mediating a transit to *E. Stuartiana*. Indeed it was with some reluctance, that *E. pulverulenta* became at all accepted into the present work, from which all dubious species for distinct illustration have been and are to be rigorously excluded. As however *E. pulverulenta* is the only species with opposite leaves, indigenous to the colony of Victoria, it was deemed desirable to accord full elucidation to it. This finally narrow-leaved form of *E. pulverulenta*, when yet in its young bushy state, has the leaves all broad and opposite; but they do not continue in that form, contrarily to what is noted elsewhere. Mr. Falck observed, that the bark of this *Eucalypt* is pervaded by a peculiar somewhat terebinthine odor, so much so as to have given rise to the local name "Turpentine-tree" for this species. It flowers from October to December; the blossoms are odorous.

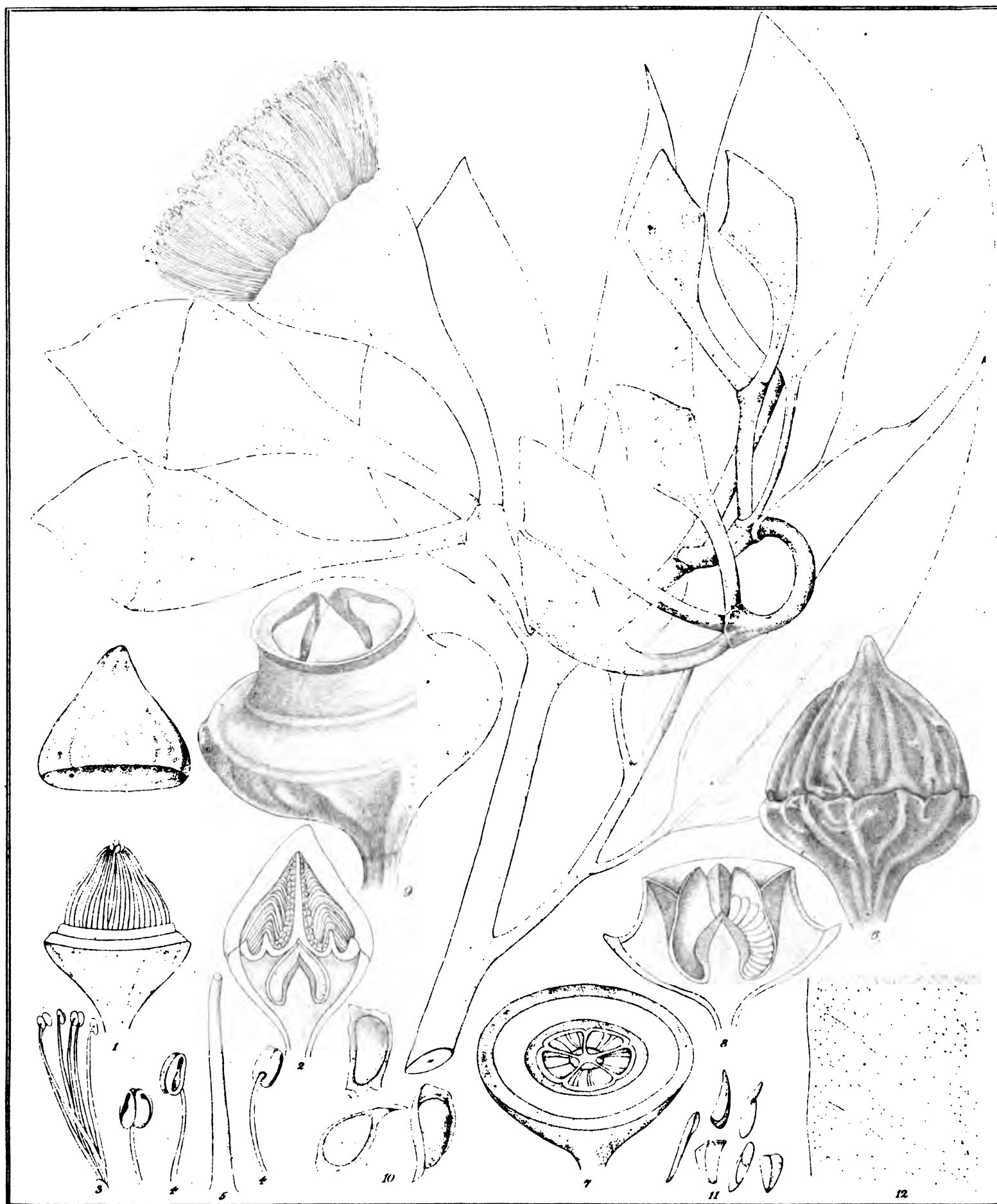
As remarked already, *E. pulverulenta* is distinguishable from *E. Stuartiana* only in its foliage, holding the same relation to the last-mentioned congener as *E. Risdoni* to *E. amygdalina*, as *E. melanophloia* to *E. crebra*, and as *E. dealbata* to *E. viminalis*. What physical causes are operating, to bring about these striking local aberrations, has as yet not been ascertained.

The bark of *E. Stuartiana* and of *E. pulverulenta* are very much alike.

It is unnecessary to adduce differential characters in contrast to other species, there being none very close akin, unless *E. viminalis* in its state *E. dealbata*, and this again bears only resemblance to the variety with elongated narrow leaves of *E. pulverulenta*; the former has however all its leaves scattered and always attenuated into very conspicuous stalks, shows more prominent and still more spreading and crowded veins, has the flowerstalklets more developed, the fruit-calices more rounded at their base, and the valves longer and more pointed.

Specific name from the powdery greyness of the foliage.

EXPLANATION OF ANALYTIC DETAILS.—1, an unexpanded flower, the lid lifted; 2, longitudinal section of an unexpanded flower; 3, some stamens in expanded position; 4-5, front- and back-view of an anther with portion of its filament; 6, style and stigma; 7-8, transverse and longitudinal section of a fruit; 9-10, fertile and sterile seeds; —all magnified, but to various extent.



Todd del. C. Tredegar & Co. Lith.

F. v. M. direxit.

Steam Litho. & Co. Printing Office, Mass.

Eucalyptus pyriformis. *Turczaninow*

EUCALYPTUS PYRIFORMIS.

Turczaninow, in Bulletin de la société impériale des naturalistes de Moscou xxii. part. ii. 22 (1849); Walpers, Annales botanices systematicæ ii. 620; Bentham, flora Australiensis iii. 226; F. v. M., Report on the forest-resources of Western Australia 15, pl. 17; E. pruinosa, Turczaninow, in Bulletin de la société impériale des naturalistes de Moscou xxii. part. ii. 23; Walpers, Annales botanices systematicæ ii. 620; E. macrocalyx, Turczaninow, in Mélanges biologiques de l'Académie de St. Petersbourg 1852, p. 418; E. erythrocalyx, Oldfield, in F. v. M., fragmenta phytographiæ Australiæ ii. 32; E. Youngiana, F. v. M., fragmenta phytographiæ Australiæ x. 5.

Shrubby or scarcely arborescent; branchlets stout; leaves scattered or rarely opposite, conspicuously stalked, from lanceolar-ovate to narrow-lanceolar, of equal green on both pages and of firm consistence; veins subtle, moderately spreading, the circumferential vein distinctly removed from the edge of the leaf; oil-dots concealed; *flowers very large*, usually three or sometimes two together on conspicuous mostly cylindrical and deflexed stalks, rarely solitary; stalklets robust, fully as long as the calyx-tube or variously shorter or undeveloped; calyces marked by longitudinal lines or ridges, the tube obconic- or depressed-hemispherical, about as long as the hard semiglobular conically attenuated or suddenly short-pointed lid or not so long; stamens all fertile, the inner much inflexed before expansion, the outer only incurved at the apex; *filaments crimson or yellow*; anthers almost oval, opening with marginal slits; stigma not broader than the summit of the style; *fruit very large*, its calycine almost hemispherical portion *traversed by longitudinal ridges, the discal portion very broad, much ascending and upwards contracted*; valves 4-5 rarely 6, nearly deltoid, their upper part exserted or almost quite enclosed; fertile seeds much larger than the partly very narrow sterile seeds and edged by a broadish marginal membrane.

In sandy scrub-regions between Port Gregory and the Murchison-River (Drummond, Oldfield); in the eastern interior of West-Australia (Rev. J. S. Price); near the Victoria-Spring (Tietkens); at Oldea, north of Fowler's Bay (Young); near Wilgerra-Hill (Giles) and near the North-side of Lake Gairdner (Mosley).

A tall shrub, flowering already at a height of 4 feet, but as a small tree attaining a height of 20 feet; stem slender, but often crooked; bark smooth. Branchlets nearly cylindrical. Leaves light-green, not shining, usually straight and equilateral, but occasionally somewhat sickles shaped, or some almost ovate and then attaining a width of two inches, the narrowest leaves contrarily merely $\frac{1}{4}$ inch broad, any of them only abnormally devoid of stalks. Oil-glands crowded and large, but concealed by the cuticle of the leaves. Flowerstalks thick, occasionally somewhat compressed and biangular, at an average about one inch long, sometimes crowded on portions of the branchlets, so as to give the inflorescence an appearance as if compound. Flowers often bent downward. Calyces remarkably variable in form, more so than indicated in Mr. Todt's excellent plate, either gradually attenuated into a conspicuous stalklet, which may attain a length of fully $1\frac{1}{2}$ inches, or suddenly contracted at the base, the very short stalklet then forming almost the basal portion of the calyx; the lid either only faintly and irregularly streaked or traversed by numerous remarkably prominent longitudinal ridges, which are however not continuous with the many still more developed longitudinal prominences of the tube of the calyx, thus a folded appearance, more striking than in the calyx of any other congener, being produced. Sutural contraction between the tube and the lid of the calyx considerable. Outer stamens attaining one inch in length. Filaments all angular; anthers yellow, fixed above the base, assuming occasionally a roundish-cordate form, the dorsal gland never very prominent; the two cells contiguous, not separated by any conspicuous connective, but widely bivalvular. Style slender,

EUCALYPTUS PYRIFORMIS.

$\frac{1}{2}$ – $\frac{3}{4}$ inch long. Stigma depressed. Fruits probably heavier than those of any other species, attaining a weight, when dry, of rather above two ounces; the discal orifice only half the width of the diameter of the whole fruit, which attains two inches; length (height) of the calycine portion of the fruit not more than that of the discal portion or not even quite as much. Placental column pyramidal-semiovate. Fertile seeds generally $1\frac{1}{2}$ – $1\frac{3}{4}$ lines long, with radiating angles from the hilum; sterile seeds very much narrower, though many of them not shorter.

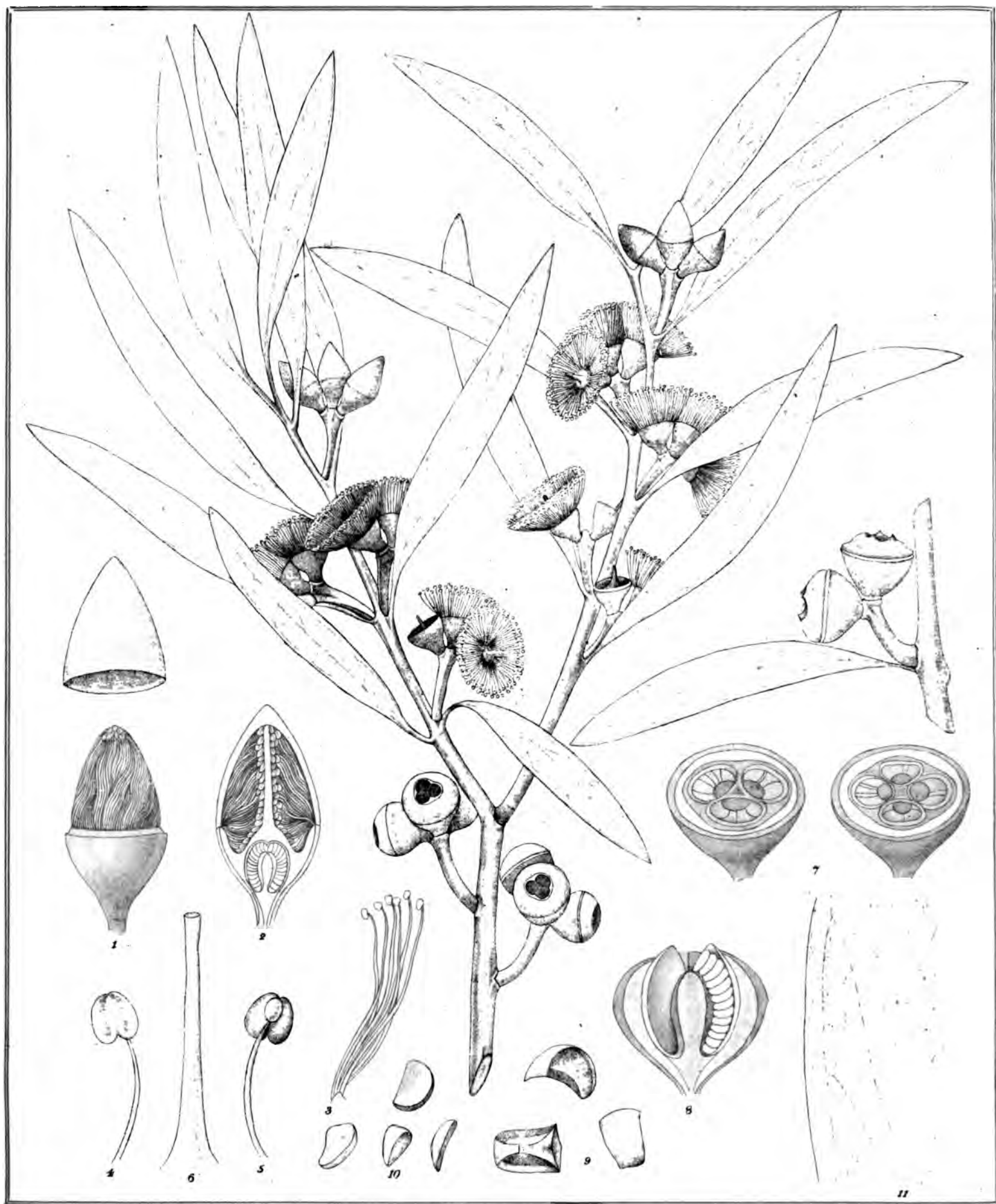
This *Eucalyptus* was described under three names by Turczaninow, it presenting such differences of forms as to induce him to regard them of specific value, and I was myself misled by aberrative states of this species to assume them to be distinct, *E. erythocalyx* moreover being described before I had access to Drummond's specimens, from the comparison of which the brief definitions, given by the Moscow botanist, could only be understood with certainty. *E. Youngiana* represents the variety with flowers devoid of stalklets and with very strongly ridged and short-tubed calyces; *E. pruinosa* of Turczaninow (not of Schauer) exhibits a variety, bearing smaller flowers with obverse pyramidal sharply few-angled calyx-tube. Drummond's collection contains unnumbered another state of this species, with broader short-stalked opposite leaves and solitary flowers, which latter however are placed quite normally on a well developed stalk.

The name, retained by Bentham and here now also for this species in its full scope, alludes to the somewhat pear-like shape of the calyx.

E. pyriformis is closely akin to *E. macrocarpa*, but any whitish bloom on it is confined to the calyces and their stalks, the leaves are always narrower and gradually attenuated at the base, only exceptionally opposite and even then obviously stalked, the flowers stand seldom singly and are never absolutely sessile, the calyx has not an even surface, the upper portion of the fruit from the edge of the calyx-tube to the rim of the disk is more elevated and at the summit more contracted, reaching beyond the base of the valves. *E. pachyphylla* approaches the variety *pruinosa* of *E. pyriformis*, but its flowers and fruits are much smaller, almost devoid of a general flowerstalk and crowded to the number of about 7 together. The affinity to *E. erythronema* is more remote.

E. pyriformis has claims for ornamental culture, especially where in an arid clime garden-copses are required.

EXPLANATION OF ANALYTIC DETAILS.—1, an unexpanded flower, the lid lifted; 2, longitudinal section of an unexpanded flower; 3, some of the outer stamens in expanded position; 4, front- and back-view of anthers with portion of their filament; 5, style and stigma; 6, a calyx of the variety *Youngiana*; 7 and 8, transverse and longitudinal section of a fruit; 9, a fully matured fruit; 10 and 11, fertile and sterile seeds; 12, portion of a leaf; 1, 2, 3, 6, 7, 8 and 9, natural size; 4, 5, 10, 11 and 12, magnified.



T. et del. C. Troedel & Co. Lith.

F. v. M. direct.

Steam Litho Gov. Printing Office Melb.

Eucalyptus santalifolia. F. v. M.

EUCALYPTUS SANTALIFOLIA.

F. v. M., in the transactions of the Victorian Institute i. 35 (1854); Miquel, in *Nederlandisk Kruid-Kundig Archief* iv. 133; Bentham, *flora Australiensis*, iii. 206; *E. pachyloma*, Bentham, *flora Australiensis* iii. 237; *E. diversifolia*, Bonpland, *description des plantes rares cultivées à Malmaison et à Navarre* 35 t. 13; De Candolle, *prodomus systematis naturalis regni vegetabilis* iii. 220.

Shrubby; branchlets firm, angular; leaves scattered, of thick consistence, narrow- or rarely broad-lanceolar, almost straight or somewhat curved, of equal color and shining on both sides, moderately or short stalked; their *veins very faint*, almost obliterated, neither crowded nor very spreading, the circumferential vein distant from the edge of the leaf; oil-dots exceedingly numerous, but concealed; umbels solitary and axillary, but soon lateral, containing 3-5 or rarely 6-8 flowers; stalks scarcely or somewhat angular, not much longer than the calyces; stalklets extremely short or almost none; tube of the calyx nearly hemispherical, somewhat shorter than the semiovate-conical lid; stamens all fertile; *filaments ascendent, not inflexed before expansion; anthers roundish-cordate*, opening in front with longitudinal at the summit convergent slits; stigma not broader than the style; *fruit depressed-globular, discal summit very convex and finally far-protruding* or sometimes rather depressed, always occupying a broad space between the valves and the margin of the calyx-tube; valves 3-4 or occasionally 5, exserted, short, mostly deltoid; sterile seeds broad, nearly as large as the fertile seeds, the latter few, sharply angular and very slightly membranous at their edges.

In sandy desert-country as also in scrubby valleys or on arid ridges near King George's Sound (Drummond), on the Williams-River (Webb), near the Kalgan-River (Oldfield), at the base of the Stirling-Ranges (F. v. M.), at Venus-Bay (Clode), in various localities near Spencer's Gulf (Wilhelmi), in the vicinity of Lake Albert (Irvine), on Kangaroo-Island (Waterhouse), occupying there calcareous ridges (Tate).

A tall shrub, fruiting however already at 5 feet, restricted to regions near the coast. The large and crowded oil-pores of the leaves well visible only after the removal of the cuticle. Flower-stalks and -stalklets variable in thickness, but never very slender, the former exceptionally somewhat compressed. Filaments whitish. Aged fruit not shining, slightly rough, the protruding summit sometimes forming fully half the fruit. Valves shorter than the space intervening between them and the edge of the calyx-tube, often very considerably so.

The approximate conformity of the fertile and sterile seeds is that of the *Renantheræ* or generality of Stringybark-trees, notwithstanding the cordate anthers, a remark applying also to *E. Preissiana*. The size and structure of the fruit bring *E. santalifolia* only near *E. macrorrhyncha* and *E. capitellata*, that of *E. Oldfieldii* being larger and also less similar on account of its prominent edge.

E. santalifolia and *E. pachyloma*, though placed widely apart and into different sections of his antheral system by Bentham, are, so far as I can judge, quite identical.

The name of *E. diversifolia*, given by Bonpland, had to be discarded, although he described the species already in 1813, and had it illustrated by Bessa simultaneously;—because the plant as defined by him represents that very young state in which, as in most species of *Eucalyptus*, the leaves pass from the broad form of juvenile plants into the narrow shape of the leaves, normal for adult trees. The illustration indicates well, that the leaves of the young seedlings are opposite sessile and oval, a sort of characteristic, which is particularly applicable for the discrimination of specific forms also in this genus.

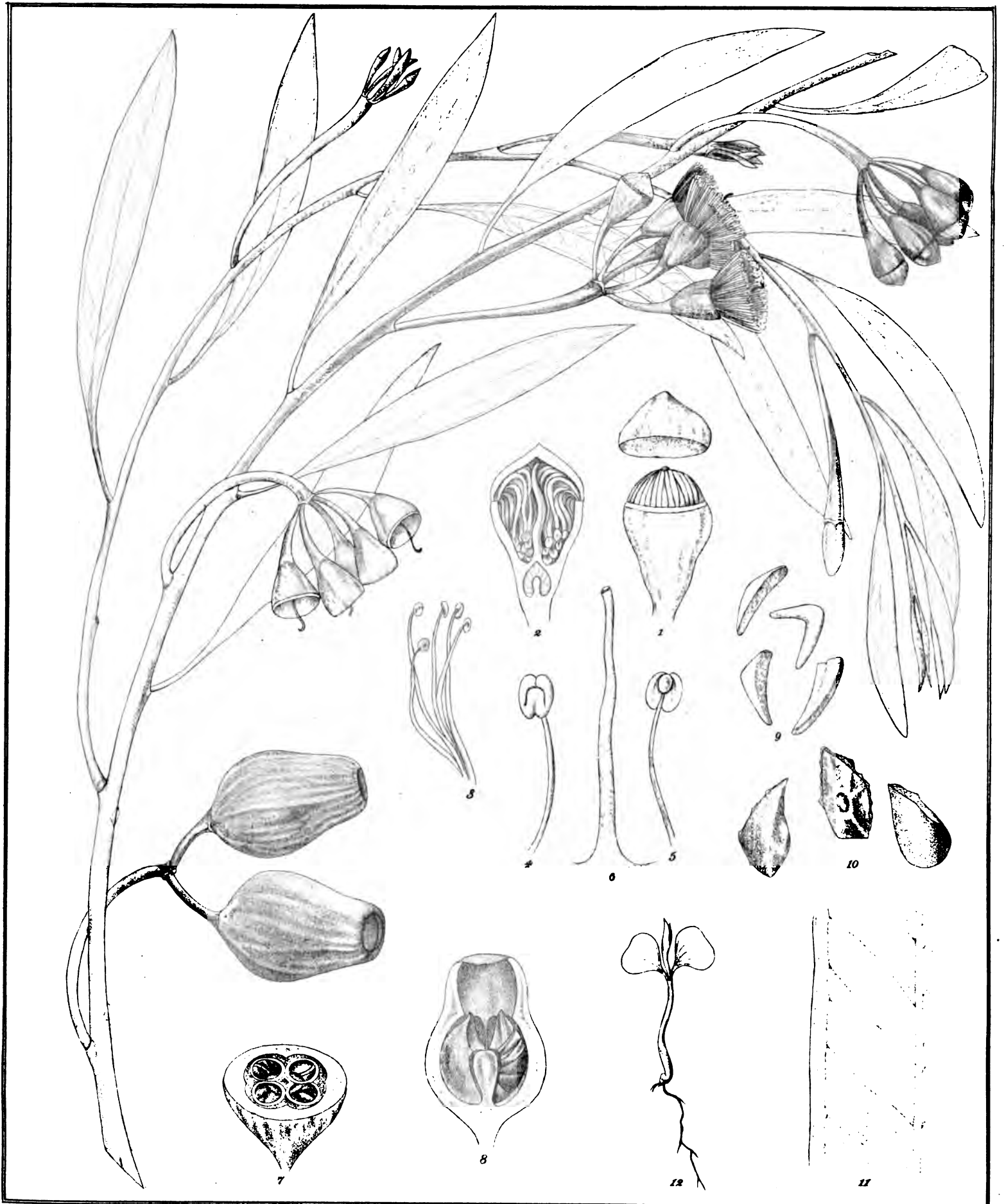
EUCALYPTUS SANTALIFOLIA.

E. santalifolia agrees with *E. capitellata* in the almost total absence of flowerstalklets, but it attains not the size of a large tree, the leaves are smaller, more rigid, of a lighter green, less conspicuously veined and not remarkably inequilateral, the flowers are generally less numerous on each stalk, the calyces are larger with wider tube and longer lid, the stamens not inflexed before expansion, the anthers more cordate than renate and the fruits usually smaller, not to speak of the seedlings of the two species, those of *E. capitellata*, according to specimens transmitted by the Rev. Dr. Woolls, being star-hairy and producing leaves narrow-lanceolar, though rounded at the base also.

The drawing in Bonpland's work represents the anthers erroneously as ovate and the fruit in that flat-topped state, in which it more particularly occurs before perfect maturity. The oval shape of the opposite leaves of young plants, well illustrated in the plate, suffices already to distinguish *E. diversifolia* from *E. viminalis*, which has narrow seedling-leaves. Moreover *E. viminalis* attains the height of a moderate and even tall tree, its ultimate branchlets are more slender, the close and more spreading venation of the leaves is nearly that of *E. tereticornis*, the flowerstalks are usually shorter and thinner, the calyces are not so large, the anthers oval, the valves in proportion to the rim larger though the fruit as a whole is smaller, the sterile seeds are much narrower than the fertile seeds and the latter obtusangular. The cardinal characteristic of *E. santalifolia* rests in the position of the stamens before their expansion; then through a simple turn the lower portion of the filaments remains decumbent, whereas the upper part becomes erect, but in no way the filaments are reduplicated. Such peculiar curvature of the stamens, while in bud, is not known to exist in any other species of *Eucalyptus*, although an approach to such a staminal æstivation is offered by *E. Planchoniana*. All other species, in which the stamens are not distinctly doubled back in their early state, namely *E. gomphocephala*, *E. Oldfieldii*, *E. siderophloia*, *E. tereticornis*, *E. salmonophloia* as well as *E. cornuta* and its allies, have the filaments in bud either straight or turned differently to those of *E. santalifolia*.

The specific name of this species was devised by some resemblance of the leaves to those of *Santalum acuminatum* and *S. persicarium*. Prof. Ralph Tate noticed, that *E. santalifolia*, together with a particular congener, which De Candolle (prodr. iii. 220) wrongly united with the East-Australian *E. cneorifolia* (*E. stricta* Sieb.), constitutes the predominant scrubs of Kangaroo-Island, that the bark is smooth and separates in long and thin shreds, that the species is found chiefly on ancient shell-beaches with fresh water below, and that it does not attain a height above 20 feet; nevertheless with a fruiting specimen, obtained from Guichen-Bay, and to all appearance belonging to *E. santalifolia*, a note is given, that there the tree rises to 60 feet, such tallness being probably of exceptional occurrence. Bonpland mentions, that this or a closely allied *Eucalypt* bore fruit as far back as 1813, in the Botanic Garden of Toulon, and he significantly then already added, that the *Eucalypts* promised to become a new source of richness to the South of France.

EXPLANATION OF ANALYTIC DETAILS.—1, an unexpanded flower, the lid lifted; 2, longitudinal section of an unexpanded flower; 3, some stamens in situ; 4 and 5, front- and back-view of an anther, with portion of its filament; 6, style and stigma; 7, transverse section of two fruits; 8, longitudinal section of a fruit; 9 and 10, fertile and sterile seeds; 11, portion of a leaf; all magnified, but to varied extent.



Todt del. C. Troedel & Co Lith

F. v. M. direct.

Steam Litho Gov Printing Office Melb.

Eucalyptus sepulcralis F. v. M.

EUCALYPTUS SEPULCRALIS.

Arborescent ; leaves rather small, scattered, on slender stalks, narrow-lanceolar, slightly curved, of equal color and somewhat shining on both sides ; their lateral veins very subtle, moderately spreading, almost concealed, the circumferential vein but slightly removed from the edge of the leaf ; oil-pores angular, much obliterated ; umbels 3-5-flowered, solitary, axillary, soon lateral ; *umbel-stalks long and slender, but much compressed* ; tube of the flowering calyx slightly bulging towards the base, thence much widening upwards, about as long as its stalklet, of about twice the length of the pyramidal-hemispherical lid, not prominently angular, but as well as the lid wrinkled ; stamens all fertile, and all inflexed before expansion ; *filaments yellow* ; anthers ovate- or roundish-cordate, bursting in front with upward confluent slits ; style elongated ; stigma not dilated ; *fruit large, urceolar-ovate, wrinkled and streaked, somewhat contracted at the margin ; orifice cylindrical ; edge of the summit narrow ; valves 4 rarely 5, very short, deeply enclosed* ; fertile and sterile seeds of nearly the same size, very angular, without any membranous appendage.

Near the Thomas-River in South-Western Australia ; Campbell Taylor, Esq.

" Strange-looking trees, with their branches hanging down all round to the ground, like those of a weeping willow," according to Mr. Taylor, through whose circumspectness and exertions branchlets of this new Eucalypt became accessible to me from a desolate place far inland. Bark of the stem smooth and whitish. Branchlets slender, angular toward their summit and tinged with a bluish-white bloom, soon becoming cylindrical and assuming a dark-bluish somewhat black hue. Leaves vividly green ; the majority from 2 to 3½ inches long, and from ½ to ¾ of an inch broad, almost equilateral, terminating into a narrow apex, narrowed into a stalk of from ¼ to ½ inch length. Umbel-stalks 1-1½ inches long, two-edged, gradually somewhat dilated upwards ; two narrow deciduous at first connate bracts enclosing the umbel in its earliest stage. Stalklets wrinkled and angular, but not much compressed or dilated. Tube of the flowering calyx from ½ to nearly ¾ an inch long, conspicuously corrugated, as well as the lid ; between the latter and former a conspicuous transverse sutural furrow. Longest stamens hardly above ½ inch long ; filaments not angular, dotted with a few oil-glands, their lower portion not flexuous in bud ; anthers whitish, inserted below the middle ; dorsal gland small, seated near the summit ; in dry anthers the slits wide and separated downward only by an exceedingly narrow intervening membrane ; in fresh or macerated anthers the slits very narrow, conspicuously distant downward, though not marginal, confluent in an arched curvature on the summit. Style yellowish, somewhat twisted. Ovary only occupying the basal portion of the calyx-tube, very much overreached by the comparatively narrow walls of the latter. Fruits about one inch long, seated on stalklets of about half that length, greyish and not shining outside, longitudinally traversed by raised and somewhat undulated streaks, the upper fourth rather suddenly ennarrowed and straight, except at the incurved summit, but this infraterminal constriction sometimes so faint as to render the fruit simply truncate-ovate. Placental column comparatively short. Valves deltoid. Seeds not numerous in each cell, mostly from 1½ to 2 lines in length, a few scarcely 1 line long ; the fertile seeds outside black, shining and marked with exceedingly subtle reticulation, the prominent angles ascending and diverging from the hilum, the summit convex and broad ; sterile seeds brown, narrower, but never very slender.

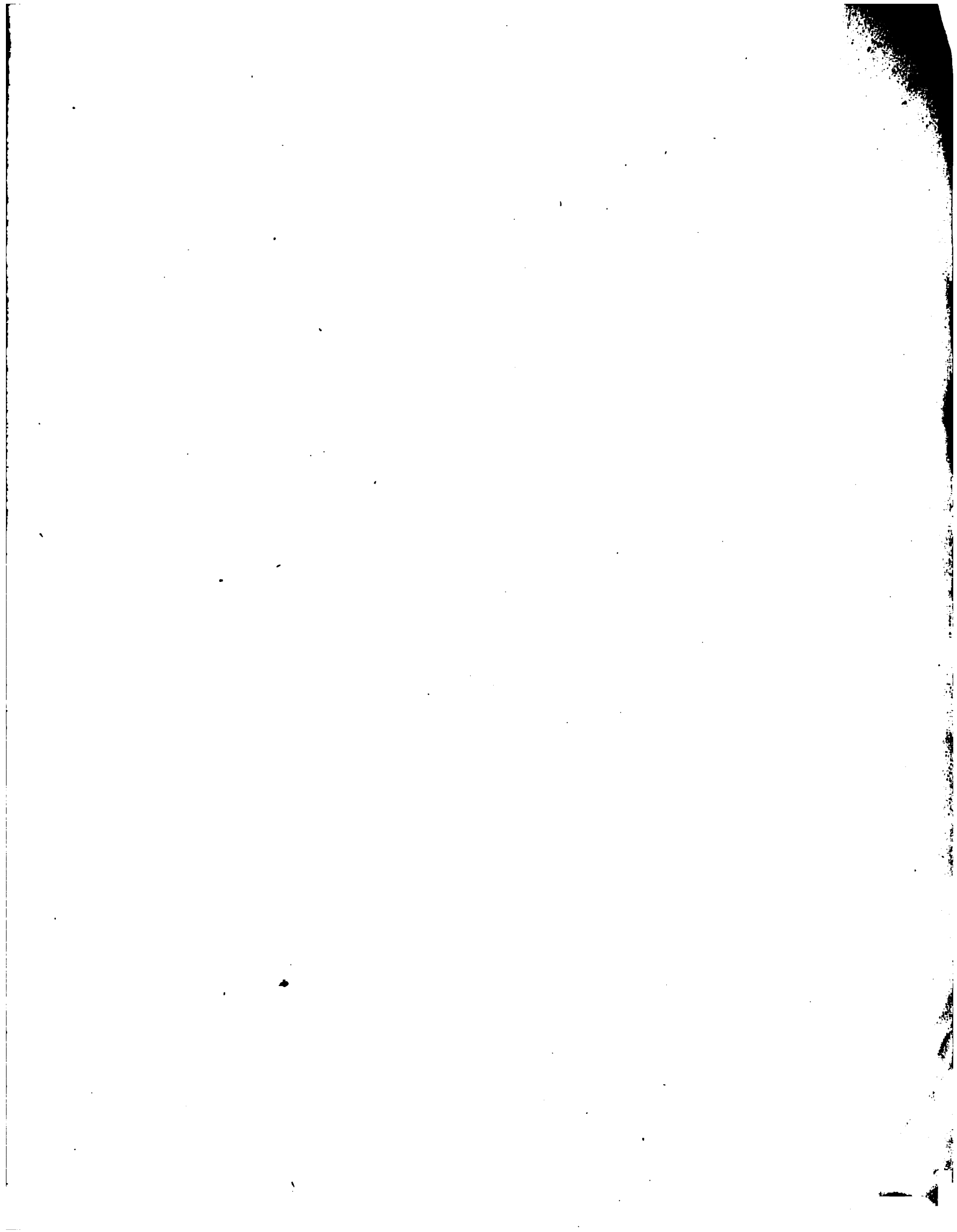
The specific name was chosen, because this Eucalypt will be destined to add another emblem of sadness to the tree-vegetation of cemeteries in climes similar to ours. It finds its systematic

EUCALYPTUS SEPULCRALIS.

place in the series of *Parallelantheræ* rather than *Renantheræ*, though it bears great affinity to *E. buprestium*, from which species it differs in the following particulars :—The leafstalks are longer, the veins of the leaves fainter, the flowers larger but fewer in number, the flowerstalks elongated and flattened, the stalklets much longer, the anthers somewhat longer than broad with more extended but less divergent slits, the fruits almost suddenly contracted below the summit and thus rather urceolar than globular, their orifice stretching much deeper downward, by which means the valves are much farther removed from the summit of the fruit. Size and shape of fruit afford an approach to *E. setosa*; their position, long stalklets and streaky exterior remind of *E. cæsia*; the anthers resemble those of *E. santalifolia*, with which it also accords in the near conformity of fertile and sterile seeds.

The importance of the form and structure of the anthers for diagnostic purposes was first recognized in the fragm. phytogr. Austral. ii. 32-70, and these characteristics have been well employed by Bentham for the primary systematic grouping of the Eucalypts. But for methods of arrangement also a carpologic system could readily be elaborated, with this advantage, that any species might thus be defined from fruiting specimens alone, which latter through the long persistence of the fruit are always obtainable in collecting-journeys, whereas flowering specimens can be got only at some period of the year, subject even to fluctuations and uncertainties. *E. sepulcralis* furnishes a good instance of the advantage of a system based primarily on fruit-characters. That species in a carpologic arrangement would thus be placed with those which have large and somewhat urceolar fruits with enclosed valves, namely : *E. miniata*, *E. perfoliata*, *E. calophylla*, *E. ficifolia*, *E. ptychocarpa*, *E. Abergiana*, *E. Watsoniana*, *E. sestoia*, and *E. corymbosa*.

EXPLANATION OF ANALYTIC DETAILS. — 1, unexpanded flower, the lid lifted; 2, longitudinal section of an unexpanded flower; 3, some stamens in expanded position; 4 and 5, front- and back-view of an anther with part of its filament; 6, style and stigma; 7 and 8, transverse and longitudinal section of a fruit; 9 and 10, sterile and fertile seeds; 11, portion of a leaf; 12, young seedlings with cotyledonar leaves;—1-11, magnified, but to various extent; 12, natural size.



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SEPULCRALIS, F. v. M.

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